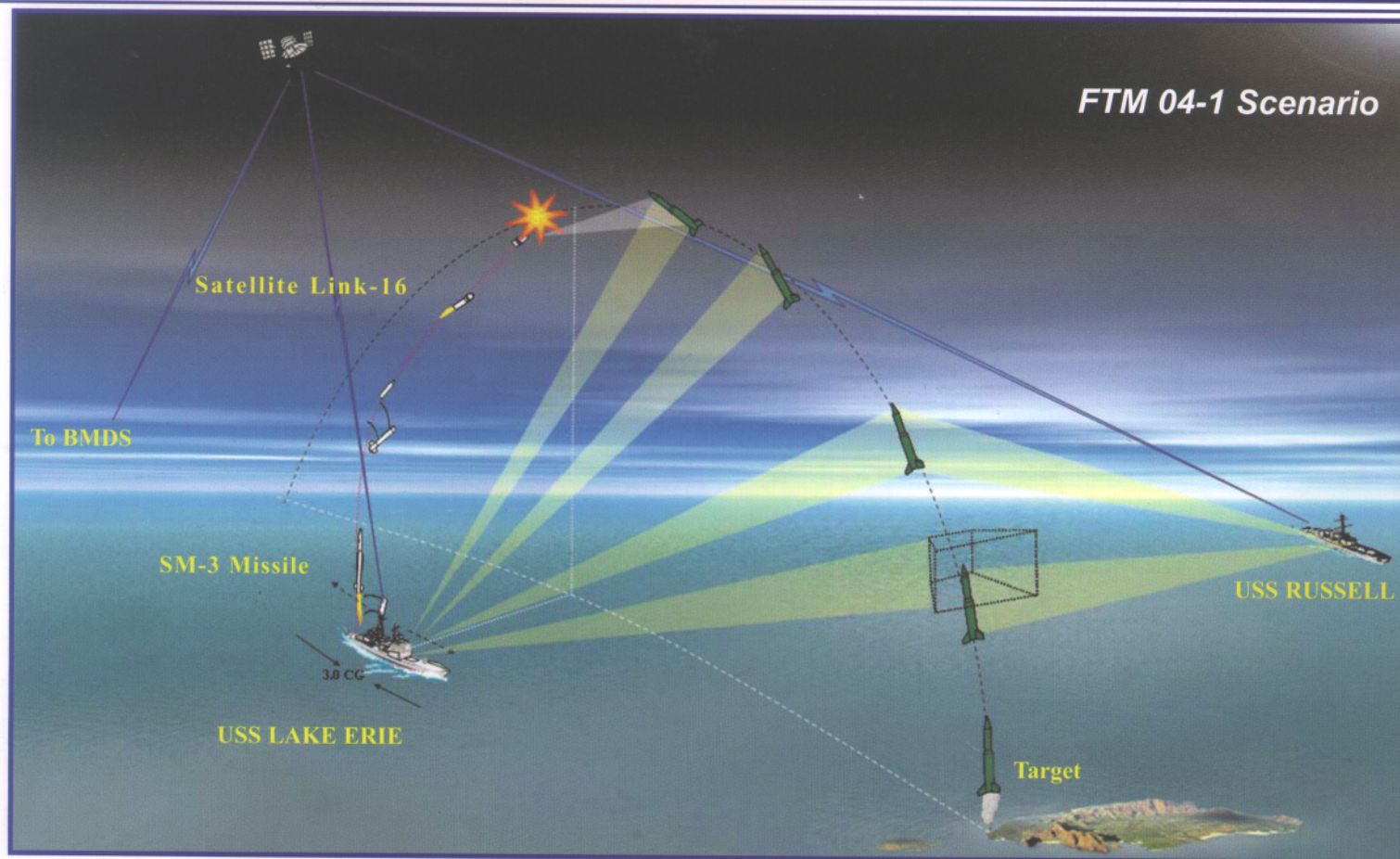


AEGIS BALLISTIC MISSILE DEFENSE (BMD) FLIGHT TEST MISSION (FTM) 04-1 FACT SHEET



FTM 04-1 Test Scenario

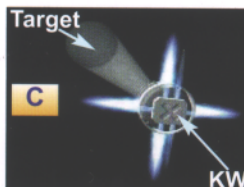
FTM 04-1, formerly known as Flight Mission-7 (FM-7), is the first flight test of the preliminary operational version of Aegis BMD's Block 04 configuration, including the BMD 3.0 Weapon System and the SM-3 Block I missile. Previous tests were conducted with the Aegis LEAP Intercept (ALI) test computer program and the SM-3 Block 0 missile. Aegis BMD Block 04 is designed to defend against short and medium range ballistic missiles (SRBMs and MRBMs).

FTM 04-1 test objectives include evaluation of the following capabilities: ability to intercept an SRBM in its midcourse phase of flight; third stage rocket motor (TSRM) one-pulse firing option used for shorter range threats; the Aegis BMD signal processor (BSP) prototype; and Ballistic Missile Defense System (BMDS) level integration. Test participants include USS LAKE ERIE (CG 70) and USS RUSSELL (DDG 59) stationed off the coast of Kauai, and a Target Test Vehicle (TTV) launched from the Pacific Missile Range Facility (PMRF).

LAKE ERIE, outfitted with the Aegis BMD 3.0 weapon system, will detect and track the target with its AN/SPY-1 radar and develop a fire control solution; its crew will fire the SM-3. The Aegis BMD weapon system will then guide the SM-3 through its first, second, and third stages. After the Kinetic Warhead is ejected from the SM-3 third stage, it will acquire, track, and divert toward the target, and complete the intercept.

RUSSELL is configured with BSP 1.0 in support of Block 06 risk reduction activities. BSP 1.0 provides a real-time S-Band radar discrimination capability through Medium Band (MB) and Synthetic Wide Band (SWB) signal processing with improved target feature extraction and classification through the use of advanced algorithms, providing precision handover of the tracked object for increased probability of engagement success.

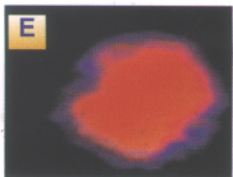
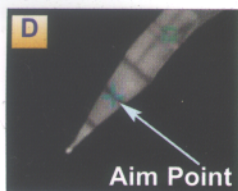
The TTV will fly a realistic SRBM threat trajectory and has an on-board transponder installed for range safety purposes only. This



transponder operates in a frequency band detectable by shore based range safety radars, but undetectable by either the AN/SPY-1 radar or the SM-3 missile.

The event commences with a no-notice launch of the TTV. The TTV flies a trajectory, reaching an altitude of over 100 miles at its highest point and achieving a velocity exceeding 5,000 miles/hour. LAKE ERIE with her SPY-1 radar detects the TTV as it breaks the radar horizon. The Aegis Weapon System (AWS) acquires the target, initiates track and transmits the track data via Satellite Link-16, a tactical data link, to other participants of the BMDS. AWS computes a fire control solution for intercepting the target. Shortly after the

TTV track is declared engagement quality, the crew onboard LAKE ERIE launches the SM-3 Block I missile. The SPY-1 radar acquires and tracks the SM-3 missile throughout the flight. AWS continuously provides guidance uplink commands during first and second stage burns of the Dual Thrust Rocket Motor (DTRM). The DTRM separates after motor burnout. Pulse 1 of the Third Stage Rocket Motor (TSRM) fires (A), providing the axial thrust required to maintain the missile's trajectory in space. The TSRM's Attitude Control System (ACS) performs a pitch maneuver, ejecting the nose cone (B), and exposing the Kinetic Warhead's (KW's) Infrared (IR) seeker. (FTM 04-1 is a single pulse TSRM engagement.) The third stage ACS orients the missile so the KW's IR seeker is pointing at the target. After ejection of the KW, the Solid Divert and Attitude Control System (SDACS) fires in sustain mode, maintaining the appropriate attitude for the IR seeker to



acquire and track the target (C). Upon acquiring the target, the KW performs divert maneuvers to close-in on the target as the target image increases in the IR seeker's field of view (D). The KW selects the lethal aim point, a guidance function to properly impact the target in the warhead section, and terminal intercept divert maneuvers are conducted. The KW hits the target, destroying it with the shear force of impact (E).

Third Stage Operations

- A: TSRM Pulse 1 Burn
- B: Nosecone Ejection
- C: IR Seeker Acquires Target
- D: Seeker Image of Target
- E: Intercept

Aegis BMD Overview

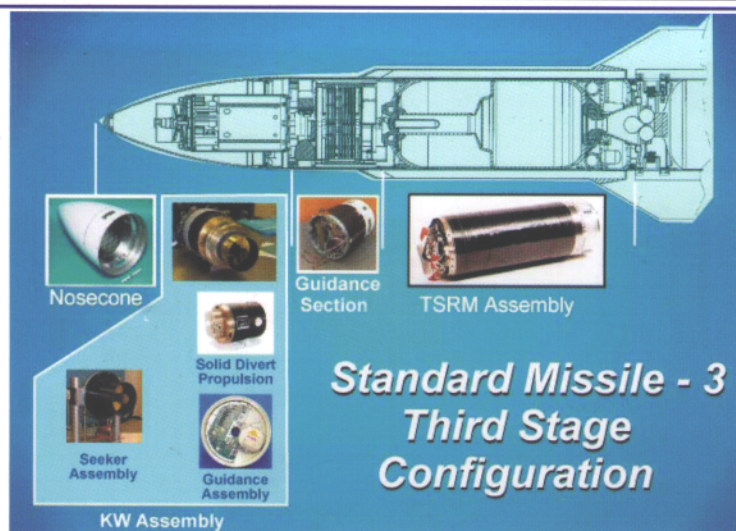
On December 16, 2002, the President announced he had directed the Department of Defense to begin fielding initial missile defense capabilities in 2004-2005 to meet the near-term ballistic missile threat to our homeland, deployed forces, friends and allies. Responding to this direction, the Missile Defense Agency (MDA) is developing an integrated system, called the Ballistic Missile Defense System (BMDS) to provide a "layered defense". That is, over time the BMDS will become capable of dealing with all three phases of a hostile ballistic missile's flight - boost, midcourse and terminal, as well as defending against all ranges of ballistic missiles - short, medium, intermediate and long range. The first capability of the BMDS is known as Limited Defensive Capability (LDC).

To fulfill the sea-based portion of the LDC, MDA, working closely with the Naval Sea Systems Command and other Navy organizations, will deploy the Aegis Ballistic Missile Defense (BMD) Block 2004 System. The Aegis BMD element of the BMDS builds on the Aegis Weapon System (AWS) and the Standard Missile (SM) currently deployed in Aegis Cruisers and Destroyers and their supporting infrastructure. Aegis BMD Block 2004 contributes two major categories of capabilities to the BMDS. The first capability is provided by Long Range Surveillance and Track (LRS&T) equipped Aegis DDG-51 Class Destroyers, which are able to detect and track Intercontinental Ballistic Missiles (ICBMs), and to report the track data to the BMDS. This tracking data is used to cue other BMDS sensors, and to provide fire control support to BMDS engagement elements. LRS&T, the first operationally deployed Aegis BMD configuration, is part of the BMDS Limited Defensive Operations (LDO). Today, Aegis Destroyers, equipped with the LRS&T capability, are on BMD patrol.

The second category of capability, initially to be resident in selected Aegis CG 47 Class Cruisers, provides the ability to defeat short and medium range ballistic missile threats in midcourse phase of flight with the Standard Missile-3 (SM-3) Block I and Block IA. This "engagement" capability is incorporated in a weapon system configuration that includes the LRS&T capability. An operational warship, USS LAKE ERIE, manned with fleet sailors and officers, is engaged in the conduct of a series of intercept flight tests designed to validate the operational utility of the Aegis BMD engagement capability against a progressively more complex set of targets and scenarios. To date, Aegis BMD has achieved four successful intercepts in five attempts. A preliminary version of this Block 2004 functionality will be implemented in two Aegis Cruisers by mid-spring 2005. There will be a total of three Aegis BMD Cruisers.

Standard Missile - 3

The Standard Missile - 3 (SM-3) evolves from the proven SM-2 Block IV design. SM-3 uses the same booster and dual thrust rocket motor as the Block IV missile for the first and second stages and the same steering control section and midcourse missile guidance for maneuvering in the atmosphere. To support the extended range of an exo-atmospheric intercept, additional missile thrust is needed.



Therefore, a new third stage for the SM-3 missile was designed, containing a dual pulse capable rocket motor for the early exo-atmospheric phase of flight and a Lightweight Exo-Atmospheric Projectile (LEAP) Kinetic Warhead (KW) for the intercept phase.

Upon second stage separation, the first pulse burn of the Third Stage Rocket Motor (TSRM) provides the axial thrust to maintain the missile's trajectory into the exo-atmosphere. Upon entering the exo-atmosphere, the third stage coasts. The TSRM's attitude control system maneuvers the third stage to eject the nosecone, exposing the KW's Infrared (IR) seeker. If the third stage requires a course correction for an intercept, the rocket motor begins the second pulse burn. Upon completion of the second pulse burn, the IR seeker is calibrated and the KW is ejected. The KW possesses its own attitude control system and guidance commands are acted upon by a solid divert propulsion system. The IR seeker acquires the target. Tracking information is continuously transmitted to the guidance assembly which controls the divert propulsion system. The KW maneuvers to intercept the target based on data from the IR seeker. The KW hits the target, destroying it with the shear force of impact. Such an intercept is referred to as "hit-to-kill".

Deployment

History was made on September 27, 2004. On that date, a Seventh Fleet Aegis Destroyer, USS CURTIS WILBUR (DDG 54), equipped with the LRS&T capability, began the world's first BMD patrol, arriving on station September 30. Operating in the Sea of Japan, CURTIS WILBUR and her sister ships have the capability to detect and track ICBMs and to transmit track data, across the Pacific Ocean, to the BMDS.

Four Pacific Fleet Aegis Destroyers had LRS&T upgrades installed in 2004 as part of the pending limited deployment of the BMDS. MDA and the U.S. Navy plan for a total of 13 LRS&T Aegis BMD Destroyers in the Pacific Fleet by the end of CY 06.

Intercept Flight Test Program History

	OBJECTIVE	OUTCOME
FM-2	Fly-by	Success, Intercept
FM-3	Intercept FM	Success, Intercept
FM-4	Ascent Intercept	Success, Intercept
FM-5	Intercept FM - Upgraded SDACS	Target acquired by KW IR Seeker. Failure in endgame. - SDACS Malfunction
FM-6	Intercept FM - Sustain Mode SDACS	Success, Intercept
FTM 04-1	Intercept FM - New Aegis BMD Computer Program (Aegis BMD 3.0) - Upgraded Missile Configuration (SM-3 Block I)	
4 for 5		